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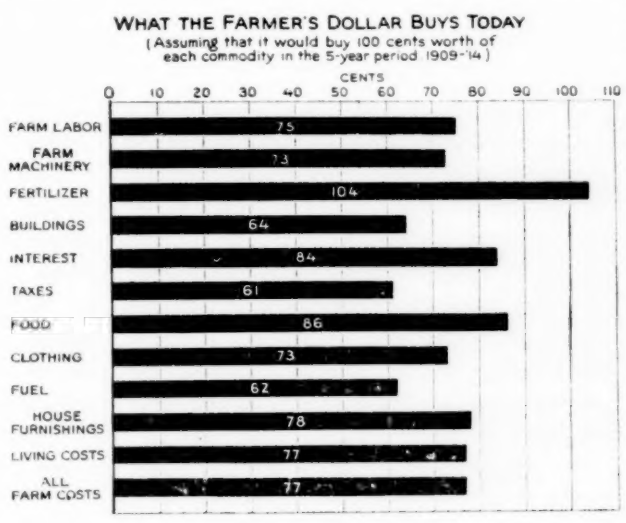
THE FERTILIZER SITUATION

H. R. Smalley, Washington, D. C.

The potato grower is as a general rule, a rather heavy user of fertilizer and is, therefore, keenly interested in the fertilizer outlook, especially the probable price.

First, let me say that although the farmer's dollar is worth only about 77 cents, as determined by the National Industrial Conference Board, his dollar is worth more than 100 cents when expended for fertilizer. The accompanying chart shows the value of the average farm dollar when spent for different purposes.



The potato grower, however, is far more favorably situated than the average farmer. On December 1st the average index of farm prices stood at only 27 per cent above prewar but the price of potatoes at the farm was 134 per cent. above the prewar level. Fertilizer is only 15 per cent to 20 per cent above the 1909-to-1914 average. The average farm dollar, therefore, buys $1.06 to $1.10 worth of fertilizer, whereas, the potato dollar based on the price December 1st will

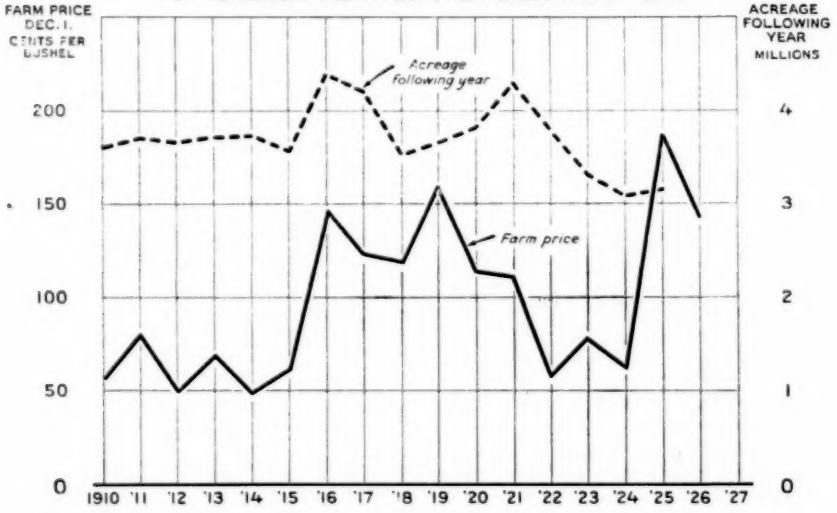
buy $1.95 cents worth of fertilizer as compared to average prices prevailing before the world war. Stated another way: If 57 bushels of potatoes were required to buy a ton of a certain grade of fertilizer in the 1909-to-1914 period, only about 29 bushels are required at the present time.

Growers are, of course, more interested in knowing how the price this spring will compare with the price last year. I am unable to give absolutely accurate figures but prices secured from various sources seem to warrant the statement that the 1927 spring prices will be substantially lower than in the spring of 1926.

Of even greater interest than the price of fertilizer is the probable price of potatoes next fall. I have made a careful study of the trend of potato production for several years and am firmly of the opinion that 1927 will be another good year. My reasons for this belief may be of interest and will be stated as briefly as possible.

Figure 1.

RELATION OF FARM PRICE OF POTATOES PER BUSHEL ON DECEMBER 1ST TO ACREAGE PLANTED THE FOLLOWING YEAR



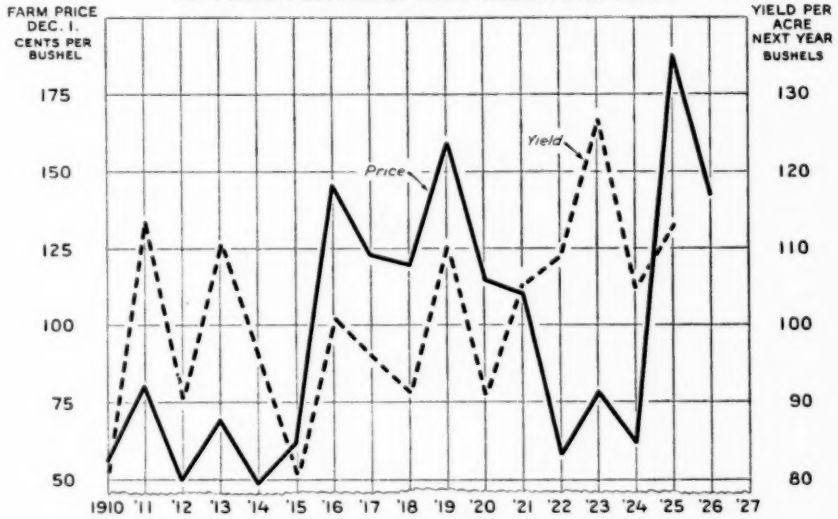
First let me say that potato growers do not behave exactly like the growers of other crops. This is due to the large amount of seed required to plant the crop. When seed is very cheap, the acreage is likely to be reduced through fear of over production and when it is extremely high the grower hesitates to take the risk of putting high priced seed in the ground and digging cheap potatoes in the fall. The farm price on December 1st averaged $1.42 for the country as a whole as compared with $1.87 on December 1st, 1925. Moreover, the price in the large surplus states is relatively somewhat less than these average prices would indicate. Certified seed,

however, is almost as high as last year. On the whole, my guess is that seed cost is still high enough to serve as an effective check on acreage expansion.

More specifically, I believe that there will be a substantial increase in acreage in the commercial potato producing states but that the total crop will not exceed 3,300,000 acres. The non-commercial states will increase their acreages little, if any, due to the high cost of seed. A commercial grower in Michigan, for example, who has several hundred bushels stored that are worth $1.20 per bushel will, more than likely, plant a larger acreage in 1927 than he planted in 1926, but an Ohio farmer will think twice before planting an increased acreage with seed that will cost him $1.70 a bushel if home grown and considerably more if it is northern grown and certified.

Figure 2.

RELATION OF FARM PRICE OF POTATOES PER BUSHEL ON DECEMBER 1ST TO YIELD PER ACRE THE FOLLOWING YEAR



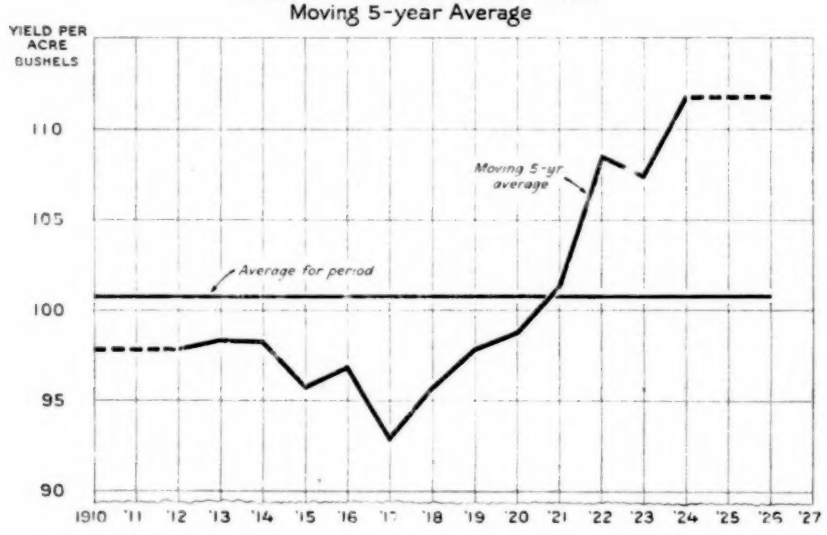
In most cases a higher price on December 1st than on the previous December 1st means an increased acreage the following year and vice versa, but the change in acreage is often not in proportion to the difference in price. **There have been five exceptions to this rule, however, in the past fifteen years,** so it cannot be taken too seriously.

Another interesting observation that has been made is that when the cost of seed is high the yield of potatoes that year will be higher than average, since growers are more likely to cultivate and spray thoroughly and to fertilize more liberally, and there is considerable basis for the argument. Barring unfavorable weather, therefore, the yield per acre in 1927 may reasonably be expected to be above the average.

Still another important consideration is the fact that there has been a significant increase in the average yields secured during the past five years over previous five-year period. This may be due in part to a series of better-than-average seasons but is more likely due in large part at least to the use of better seed. The yield during the last five years has been 111.7 bushels whereas for the previous five years (1917-1921) it was only 97.8 bushels—a difference in the average yield for the two periods of 14 bushels. I am inclined to credit most of this improvement in yield to better seed, seed treatment, fertilizing and spraying and to believe that it will require an extremely unfavorable season to bring the average acre yield as low as 105 bushels.

Figure 3.

YIELD OF POTATOES, 1910-1926
Moving 5-year Average



The yield per acre in 1927 will probably equal the average of the past five years—112 bushels. This yield on 3,300,000 acres would mean a total production of 370 million bushels, only 14 million bushels more than were produced in 1926. Such a crop would probably average about $1.25 a bushel at the farm for the entire country but in the great surplus States—Maine, Michigan, Wisconsin and Minnesota—it would mean not more than 75 to 80 cents a bushel.

Should the season be especially favorable resulting in an acre yield of around 120 bushels, a total crop of 395 million bushels, the average price would drop to a dollar a bushel or less which would mean 50 to 60 cents in the surplus states. The chances are that this **will not happen.**

On the other hand, an extremely unfavorable year might result in a yield as low as 105 bushels per acre or a total crop of around

345 million bushels. Such a crop would average more than $1.50 per bushel at the farm and $1.25 or better in the surplus states. The chances are also that this **will not happen.**

To sum up, the outlook for the potato grower for 1927 is a bright one. The acreage will not be unduly expanded on account of high seed cost; the yield per acre will, more than likely, be around 110 to 115 bushels per acre, but even so there is every reason to believe that the price will be satisfactory.

Those growers who plant good seed, fertilize liberally and spray thoroughly have about a ten-to-one chance of making a substantial profit in 1927.

FERTILIZER EXPERIMENT WITH GREEN MOUNTAIN POTATOES

F. C. Deitz, Farmingdale, Long Island

During the season of 1926 the State Institute of Applied Agriculture developed and carried out plans for a three year fertilizer experiment with potatoes under continuous cropping. The objects of the experiment are to determine the influence of potash on the growth and yield of potatoes and the residual effect of fertilizer under such a system of continuous cropping.

The soil on which the experiment is being conducted is a sassafras, gravelly loam. For the past few years, general farm crops have been raised on this land, but no crops receiving heavy applications of fertilizer. Upon such soil it was believed that any influence of heavy application of fertilizer would be quickly reflected in yields.

In the spring of 1926, stable manure was applied to the experimental field at the rate of approximately ten tons per acre. After plowing in March, the land was fitted thoroughly and staked out for fertilizer and planting. The field was next laid out in 9 plots of 1/6 acre each, having 10 rows to each plot. The planting was done April 16th and cultivation and spraying were done in accordance with best local farm practices. The seed used in this work was Maine certified Green Mountain seed.

The basic analysis used in this experiment was a 5-10-5 and the application was at the rate of two thousand pounds per acre. In mixing the fertilizer for the several plots, the following formula was used:

100 lbs. nitrate of soda
150 lbs. ammonium sulfate
100 lbs. dried blood
300 lbs. tankage
1160 lbs. 16% acid phosphate
200 lbs. highgrade sulfate of potash

Where potash was used it was obtained from high grade sulphate of potash, the amount varying from nothing to 200 lbs. and 400 lbs. As the percentages of nitrogen and phosphorous were to remain constant, these carriers were mixed first. Then the proper amount of potash to supply the percentage shown in the field plan given below, was mixed with the nitrogen and phosphorous. Great care was taken in each case that the same amount of nitrogen and phosphoric acid was applied to each plot receiving fertilizer.

9	8	7	6	5	4	3	2	1
Check	5-10-10	5-10-5	5-10-0	Check	5-10-10	5-10-5	5-10-0	Check

Considerable difference between the no-fertilizer plots and those receiving fertilizer was observed throughout the growing season. The check (no fertilizer) plots were less vigorous and the color of the foliage was very much lighter than that of the fertilizer plots; those plots receiving complete fertilizer showed more vigor. This difference was especially noticeable during the first part of the growing season. In the plots receiving the high percentage of potash, there was a much more rapid recovery from hopper injury and "Tip burn."

All of the plots were harvested on September 1st. After careful grading and examination of the tubers from the plots for diseases of the tubers, the yields of the several plots were graded into a first grade and culls. The yields are given in the following table:

No. of Plot	Treatment	Yield Per Acre No. 1 Grade bushels	Culls bushels
1	Check	145.2	23.59
2	5-10-0	143.99	43.39
3	5-10-5	183.92	27.83
4	5-10-10	267.41	9.68
5	Check	146.41	19.96
6	5-10-0	160.32	36.9
7	5-10-5	197.23	36.67
8	5-10-10	249.26	19.36
9	Check	148.83	23.59

SUMMARY—

Fertilizer treatment	Yield per acre in bushels 1st Grade	Culls
*Check plots (no fertilizer)	146.83	22.38
Fertilizer 5-10-0	152.15	39.64
Fertilizer 5-10-5	190.57	30.25
Fertilizer 5-10-10	258.34	14.52

*Average for three plots, all others for 2 plots.

From observations made this past season there is evidence that the amount of potash in the fertilizer may have some effect on tuber diseases as rot and scab. It will be noted from the above table of yields that the percentage of culls in the plots receiving potash was less than in the plots receiving nitrogen and phosphorous but

no potash. This difference was partly due to the decreased number of small tubers. It was also found that the percentage of tubers affected with rot and scab was less on the plots receiving potash and apparently decreased with the increase in potash. No definite conclusions can be made at this time, but the indications raise some interesting questions. It is hoped to make a more intensive study along these lines in the next two years of this experiment. The influence of potash on yield of tubers is clearly indicated from the past season's records. This experiment is to be continued on the same plots and it is hoped that further interesting data will be secured which may be of value to potato growers on Long Island, growing potatoes under similar soil conditions.

THE PENNSYLVANIA POTATO GROWERS ASSOCIATION

The Annual Meeting of the Pennsylvania Potato Growers Association was held at Harrisburg, January 19th and 20th, in connection with the Pennsylvania Farm Products Show held at the same place.

The attendance at the meetings and the interest and enthusiasm shown by those present exceeded that of any former meetings. The average attendance at the three regular sessions was between five and six hundred.

The outstanding feature of the program was the absence of speeches. With one exception growers were in full charge of the discussions which were informal and spirited. The first afternoon given over to a discussion of the methods used by the 400 bushel growers of which there were 97 in the state this year, was probably the most interesting. Nothing has called attention to the better practices in potato culture in this state more than the accomplishment of these outstandng growers. Spraying, good seed, organic matter and just ordinary common potato sense were the outstanding features brought out by these men. A lively discussion on the use of labor saving devices in potato growing brought out many new features in the machinery line.

A new feature in the Potato Show was the exhibit by each 400 bushel grower in the state this year of the potatoes taken from 40 feet of a row. They were exhibited as they were taken from the ground. Each man's pile gave good indication of the kind of crop he secured.

The quality of the Potato Show in general was good and in size equal to that of former years.—**Miles Horst, Harrisburg, Pa.**

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OFFICE EQUIPMENT FUND

This fund is constantly increasing and the time will soon come when the Secretary—Editor—Business Manager of your Association will have office equipment so that the work can be done efficiently. During the past month Frank G. Rowley, Rowley Spud Farm, Alliance, Nebraska sent in $1.00 and Newman Hungerford, Torrington, Conn. included $2.00 for this fund with his dues. When paying your dues remember every bit helps.

REPRINTS

Reprints of papers presented at the last Annual Meeting may be had by writing E. V. Hardenburg, U. S. Dept. of Agr. Washington, D. C. and paying for the cost of printing.

MEMBERSHIP COMMITTEE

There will be a representative of this committee in each state and province who has the authority to appoint as many assistants as are needed to promote the welfare of the work. The duties of this committee are to solicit new memberships and to collect dues. **If you know you are in the arrears with your dues save the representative of the membership committe for your territory the expense and time of writing you by sending in your dues at your earliest convenience.** This is one way you can help and your efforts will be greatly appreciated.

This membership committee is large and much is expected of each member according to the bushels of potatoes produced and the number of growers in his or her territory. Here is an opportunity for keen competition.

The names of those appointed to date are given below.

H. C. Moore, Chairman, Agricultural College, Lansing, Michigan
E. L. Newdick, Department of Agriculture, Augusta, Me.
Miss Elizabeth L. Clarke, E. Corinth, Vermont
B. A. Brown, Agricultural Experiment Station, Storrs, Conn.
O. R. Butler, Agricultural Experiment Station, Durham, N. H.
Daniel Dean, Nichols, N. Y.
Wm. H. Martin, Agricultural Exp. Sta,. New Brunswick, N. J.
K. W. Lauer, Dept. of Agriculture, Harrisburg, Pa.
F. W. Geise, Maryland University, College Park, Md.
H. H. Zimmerly, Truck Experiment Station, Norfolk, Va.
L. O. Gratz, Hastings Lab., Hastings, Fla
G. L. Tiebout, Agricultural Experiment Sta., Baton Rouge, La.
J. A. McClintock, University Tenn., Knoxville, Tenn.
J. S. Gardner, Agricultural Experiment Sta., Lexington, Ky.
Dee Crane, Agricultural Experiment Sta., Morgantown, W. Va.
Earl Jones, Ohio State University, Columbus, Ohio.
R. P. White, University of Kansas, Manhattan, Kansas
H. O. Werner, University of Nebraska, Lincoln, Nebraska
C. M. McCrary, Michigan State College, E. Lansing, Michigan
J. G. Milward, University of Wisconsin, Madison, Wisconsin
A. G. Tolaas, University Farm, St. Paul, Minn.
F. M. Harrington, Agricultural College, Bozeman, Montana
Lou D. Sweet, 1641 Stout St., Denver, Colorado
E. R. Jackman, Agricultural College, Corvallis, Oregan
E. R. Bennett, State House, Boise, Idaho
Geo. L. Zundel, Agricultural College, Pullman, Washington
J. T. Rosa, University of Calif., Davis, California
S. C. Peppin, Experiment Farms, Charlottetown, P. E. I.
C. Tice, Dept. of Agriculture, Victoria, B. C.
O. C. Hicks, Department of Agriculture, Fredericton, N. B.
J. F. Hockey, Kentville, N. S.
John Tucker, Ontario Agr. College, Guelph, Ont.
W. H. Tawse, Macdonald College, St. Anne de Bellevue, Quebec
H. S. MacLeod, University of Sask., Saskatoon, Sask.

The following comment will help in securing new members. "The American Potato Journal must be very interesting to the potato growers of the United States and Canada. It is exceedingly interesting to one who is not a grower and the writer reads it from cover to cover with a great deal of enthusiasm. It is certainly well edited."—Yours very truly, Wm. Penn Jones, Impl't Works, W. P. Jones, Mgr., Minneapolis, Minn.

CROP AND MARKET NEWS

THE OUTLOOK FOR 1927 POTATOES.

(Contribution from the Fruit and Vegetable Division, Bureau of Agricultural Economics, U. S. Department of Agriculture)

It is interesting to note how quickly the crop aspect of the potato situation changes. A month ago there was much talk of a very considerable increase in the intended acreage this season, and such an increase may still develop in the late-shipping states, where the bulk of the crop is produced. But the rumor of a similar gain in acreage throughout the southern States seems to have been unfounded, according to present information.

The Agricultural Outlook Report for 1927 was released on January 28. In substance, this is what the report said on potatoes: After the relatively limited potato acreage of the past few years and the short crops and favorable prices of 1925 and 1926, there seems to be some danger of overplanting this season. Early reports from many sections indicate a possible increase of 13 per cent in the 1927 potato acreage as a whole. With average yield of 112 bushels per acre, such an increase of plantings would result in a 400,000,000 bushel crop, or only 21,000,000 less than the huge production of 1924 and growers doubtless would receive low prices. The disastrous season of 1924-25 should be a warning against any increase of acreage as great as 13 per cent. After the heavy production and poor returns of that season, plantings were reduced in 1925 to the lowest total in more than 20 years.

Since 1925, the tendency has been to increase the potato acreage annually and bring it back to normal. The decrease in 1925 and the increase last year were noticeable in both the early and the late States. Production also followed this trend in both the South and the North. In other words, after a short-crop year, heavier plantings in the early shipping sections seem to be a rather sure indication of proportionately larger acreage throughout the North or the main-crop States.

Now the picture becomes a mixture of brighter and darker colors. The darker aspect, so far as price is concerned, arises from the reports of heavier acreage in Florida and a record-breaking crop in the Rio Grande Valley of Texas. The brighter tone is found in later reports of a possible decrease in plantings in other southern States. Florida growers, without much doubt, seem to have gone in for potatoes more heavily this season. In the lower Rio Grande Valley of Texas, it is estimated that 14,000 to 15,000 acres have been planted, compared with 6,300 last year. Favorable weather made it possible to put out Texas potatoes several weeks earlier than usual, and planting was nearly completed by February 1. If growing conditions continue good, this crop will be moving to market early, possibly starting by the middle of March. Between

the middle of March and the end of May last year, Texas shipped about 1,600 cars of potatoes, and the heavier plantings this year may indicate a movement of 3,000 cars. In that event old potatoes will meet some competition from Texas by the opening of spring, and from Florida there will be increased competition a little later.

Meager reports from other southern States, beginning at Louisiana and extending around the coast to Virginia, make it appear as if the acreage of early potatoes may be decreased by 10 or 15 per cent, instead of being increased. South Carolina may plant about the same acreage as in 1926. Later reports, of course, may change materially the present outlook, but now it seems that a general reduction is intended, even in Virginia, the most important of the early-potato States. In this event, mid-season or intermediate potatoes ought to find a fairly good market. Growers in the middle potato belt or farther North, who are in position to plant slightly heavier acreages for nearby city markets, may find it to their advantage to do so, provided these potatoes will be ready for market before the main crop starts to move.

If one can judge at all by the car-lot movement to southern States, the early reports of an intended decrease in many of these States seem to be substantiated. Shipments of seed stock from northern Maine were very active in January, with cars going chiefly to Florida, Georgia, the Carolinas and Texas. Prior to January, the movement of seed potatoes was light. It was impossible to segregate seed from table stock in the following tabulation of shipments, but the total movement from Maine to States indicated is worthy of consideration as an index of the early-potato situation:

Car-lot Shipments of Potatoes from Maine

Destined to—	Jan., 1927	Season total to Feb. 1, 1927	1926	Total last season
Florida	184	1069	1034	1150
Georgia	217	547	670	753
N. Carolina	176	232	239	427
S. Carolina	286	362	439	505
Texas	163	195	95	108
Total to 5 States:	1026	2405	2477	2943

To February 1, the movement to Virginia was very light and there was no indication that the shipments from Maine to that State would be as heavy as they were last year. Virginia took nearly 1,000 cars of Maine potatoes last season.

No definite information is at hand concerning the intentions of potato growers in the northern part of the United States, but an official statement indicates that planting in Prince Edward Island, Canada, may be 30 or 40 per cent heavier than in 1926. Much of

this acreage is planted, of course, for certified seed potatoes. Total exports from Prince Edward Island the coming season are expected to exceed 4,000,000 bushels. The United States received about 1,485,000 bushels from the Island last year and 906,000 in 1925. Considerable quantities also go to Cuba, Porto Rico, the Virgin Islands, Hawaii and the Philippines.

During the last three weeks of January and the first week of February, combined shipments of potatoes from points in the United States totaled about 16,000 cars, compared with 14,300 during the same period last season. At times, the weekly output was 800 or 900 cars heavier than for the same week in 1926, and market values declined continuously. By February 5, the general level of f. o. b. prices was about 35 cents per 100 pounds lower than the month before, and a similar weakness was observed in terminal markets. Shipping-point quotations averaged just about half what they were in early February, 1926. The western New York price of $1.90 per 100 pounds of sacked Round Whites was in greatest contrast to the price a month ago. Northern Maine shippers were getting around $2.00 on bulk Green Mountains, and the range for sacked potatoes in the North Central was $1.65-$1.90. Idaho Russet Burbanks suffered less of a decline than did any other potatoes; the early February cash-track price in southern Idaho was about $1.75. Though the official report had not yet been made, there was a general feeling that stocks remaining for future shipment throughout the northern producing sections were somewhat heavier than a year ago.

The month's price declines in city markets ranged from 10 cents to 40 cents per 100 pounds, eastern Round Whites showing the greatest drop. These potatoes, chiefly from New York and Pennsylvania, were jobbing at $2.15-$2.50 in early February, as against Maine Green Mountains at $2.40-$3.00. Bulk Green Mountains from Long Island sold in New York at $3.20-$3.35, and the Chicago price on northern Round Whites was $2.00. Idaho Russet Burbanks brought $2.70-$2.80 in Chicago. First arrivals of Triumphs from Cuba were bringing $4.00-$4.25 per bushel crate in New York. Triumphs from Bermuda sold at $14.50 per barrel of No. 1's and $12.50 for No. 2 grade. Detroit dealers were quoting similar potatoes from South Texas at $5.00 per 100-pound sack.

New York.—The New York Cooperative Seed Potato Association has shipped a consignment of 5,000 pounds of seed potatoes by steamer from New York City to Ecuador in South America. Students of history will remember that the potato originally came to us from the Peruvian Empire of the Incas, conquered by the Spaniards in 1532, and that Ecuador was part of the famous Indian Empire.—**Daniel Dean.**